International Journal of Economics, Commerce and Management
United Kingdom Vol. V, Issue 3, March 2017
http://ijecm.co.uk/ ISSN 2348 0386

ROBUST PEARSON CORRELATION ANALYSIS OF VOLATILITY FOR THE ISLAMIC BANK IN MALAYSIA: AN ARITHMETIC APPROACH IN ISLAMIC FINANCIAL ENGINEERING

Nashirah Abu Bakar
Islamic Business School, College of Business, Universiti Utara Malaysia, Malaysia
nashirah@uum.edu.my

Sofian Rosbi
School of Mechatronic Engineering, Universiti Malaysia Perlis, Malaysia

Abstract

Volatility of stock markets has created much attention among investors because high volatility can bring high returns or losses to investors. This paper investigates the volatility of Islamic bank shares price in Malaysian market. Pearson correlation coefficient analysis is selected to calculate the correlation between volatility and return. This study found that the p-value of share price is 0.198 and normally distributed according to normality test (Shapiro-Wilk). In addition, the p-value of return and deviation (volatility) are normally distributed according to normality test (Shapiro-Wilk). From the Pearson correlation analysis the association between deviation (volatility) and return is positive strong correlation (r = 1). As a conclusion, positive volatility contributes positive return. Meanwhile, negative volatility contributes negative return.

Keywords: Financial Engineering, Volatility, Islamic Bank, Pearson, Mathematical derivation

INTRODUCTION

Volatility of stock markets has created much attention among investors because high volatility can bring high returns or losses to investors. This situation creates a risk to investors, because a rational investor always makes an investment decision based on risk and return (Lee, et al., 2016). There have been many researches that have been carried out to measure the volatility of stock price. Siddikee and Begum (2016) highlight two factors that affect stock prices. Firstly, macro factors which include rising interest rates, unanticipated inflationary movement, productivity levels of the industry, political and others may have significant impact on the potential benefits of the company. Stock market always works within a framework, when this changes due to government intervention, market faces volatility. Besides that, changes in economic growth also cause market volatility. Secondly, micro factors including change management, availability of raw materials, labor productivity and others can affect the profitability of the company consequently the stock prices also. If investors fail to predict the future reliably, volatility will occur.

According to Albaity and Shanmugam (2012) the history of traditional finance theories are built on the assumptions of the neoclassical economics. The neoclassical theory of economics is based mainly on three fundamental inter-linked assumptions that are the goal of any individuals in the economy is to maximize his/her utility. The maximization of utility is done by being a rational individual who will weigh risk and return in each situation and nothing else. The other assumption is that the decision maker in any economic decision is the individual and not the society as a whole. The theory of finance is based on the individual as an investor who decides rationally to invest or not in any investment opportunity based on the concept of how much does he/she maximizes his/her utility. The neoclassical theory of economics is different with the concept of Islamic economic. Islamic economic refer to the system that followed Sharia law.

In Malaysia, the Islamic banking and finance industry had a humble beginning in 1969 with the establishment of the Pilgrims Management and Fund Board (PMFB) which was originally established to collect and mobilize saving from those who intend to go for the hajj (pilgrim) in Mecca (AbdMajid and Kassim, 2015). Consequently, in 1980 a call by Bumiputra Congress to start the Islamic banking is followed by the National Steering Committee in 1981 performing a study on the worth of making a new Islamic bank in Malaysia taking into account different aspects (Al Nasser and Mohammed, 2013). As the results from the discussion among the committee, in 1983, Malaysia was established the first Islamic bank in Malaysia know as Bank Islam Malaysia Berhad (BIMB) as the alternatives to the interest-based conventional banking system. Thus it is important to examine the performance of BIMB as the first Islamic banking institutions in Malaysia.

Besides that, the growing up of the Islamic financial products and services in Malaysia and over the world was attracted most of the Muslim' peoples to participant with the product that are in line with the sharia law. The main forbidden concept in sharia law such as *riba*, *gharar* and *maisir*, gives an opportunities to Muslim investors to invest in Islamic investment. Many researches regarding the volatility performance of conventional bank are done, such as Tan and Floros, 2012; Watanabe, 2001; Kuo, et al., 2005; Singhania and Anchalia, 2013. However, study regarding volatility performance of Islamic bank is still lack of interest among the researchers. Thus, this study try to fulfill the gap by examine the volatility of Islamic bank in Malaysia, specifically Bank Islam Malaysia Berhad (BIMB) in order to determine the volatility and return of Sharia stock. According to Brailsford and Faff (1996) identify the best volatility forecasting technique is a critical job because a best predict volatility forecasting techniques not only depends on data availability and predefined assumption but also depends on the quality of data (Lee, et al., 2016; Abraham et al, 2007).

LITERATURE REVIEW

A number of studies have been undertaken on how the volatility is reflecting on the real returns that investors earn. Faff and McKenziet (2007) concluded that low or even negative return autocorrelations are more likely in situations where: return volatility is high; price falls by a large amount; traded stock volumes are high; and the economy is in a recessionary phase.

Albaity and Shanmugam (2012) investigate the reaction of the Malaysian stock market on the international financial arena as a result of different inflows of information and economics shocks from the international stock markets. Using a univariate GARCH have exposed Malaysia to be susceptible to shocks and having a higher leverage effect as compared to other market in the analysis.

Byun et al. (2011) examine the superiority of the implied volatility from stochastic volatility model over the implied volatility from the Black and Scholes model. This study found that the implied volatility from a stochastic volatility model is not superior to that from the Black and Scholes model for the intraday volatility forecasting even if both implied volatilities are informative on one hour ahead future volatility. The forecasting performances of both implied volatilities are improved under high volatile market or low return market. Mareno, et al. (2014) investigates the effect of predictors of growth (entrepreneurial orientation and environmental hostility) and growth itself on small-firm volatility. They find that some of the predictors on growth can also be used to predict firm volatility. Specifically, firm volatility is influenced by entrepreneurial orientation and environmental hostility. Growth also influences firm volatility. The study also finds a strong interaction effect of growth and firm size on firm volatility.

Singhania and Anchalia (2013) studied the impact of global crisis on volatility of stock returns; that can help in better policy selection and implementation in the scenario of financial downturn. Looking at the increase in volume of trades between Asia and the world, Asian markets have gained prime position within global financial industry. Thus, it is essential that more researches are employed for better understanding of Asian Markets. This study found that the sub-prime crisis had a positive impact on the volatility of returns of Japan, China and India while it had no impact on the volatility of returns of Hong Kong. In addition, it is interesting to see that the period of Eurozone debt crisis has had a negative impact on the volatility of already highly volatile stock returns of countries such as India and China. However, no impact on volatility of stock market returns in Japan and Hong Kong was observed of the Eurozone crisis. Also the authors noticed volatility clustering, persistence, asymmetry and leverage effects' in stock returns series of Hong Kong, Japan, China and India.

Kuo, et al. (2005) investigates the relations among price volatility, trading activity and market depth for some selected futures contracts traded on the Taiwan Futures Exchange (TAIFEX) and Singapore Exchange Derivatives Trading Division (SGX-DT). This study finds that the estimates of the conditional mean function of the two futures markets are consistent with weak-form efficiency. Second, the evidence suggests that volatility is higher during periods of high futures trading volume for the TAIFEX and SGX-DT futures markets. This study also demonstrates that existing market depth does not mitigate volatility in the SGX-DT and TAIFEX futures markets. Boonvorachote and Lakmas (2016) investigate the impact of trading activity including trading volume and open interest on price volatility in Asian futures exchanges. The results show a positive contemporaneous relationship between expected and unexpected trading volume and volatility, while open interest mitigates volatility.

METHODOLOGY

To validate the relationship between return and volatility, the mathematical and statistical procedure need to be performed.

Derivative for rate of return

This research implement below equation for rate of return for share price:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100\% \quad (1)$$

where R_t is rate of return for period *t*, P_t is share price at period *t* and P_{t-1} is share price at period *t-1*.

Then, we calculate the average return for 43 days trading period as below equation:

$$R_{average} = \frac{\sum_{t=1}^{t=n} R_t}{n} \quad (2)$$

where $R_{average}$ is average rate or return for particular selected period, R_t is rate of return for period *t* and *n* is number of trading days in selected period.

Derivative of volatility

Volatility is a statistical measure of the dispersion of returns for a given security or market index. Volatility can either be measured by using the standard deviation between returns from that same security or market index.

For the volatility, the calculation derives as follow procedure:

The deviation of return is calculated as below.

$$Deviation(D_t) = R_t - R_{average} \quad (3)$$

Then, the deviation is squared,

$$D_t^{\,2} = \left(R_t - R_{average}\right)^2 \quad (4)$$

Next, the variance for period t is calculated as below:

$$Var_t = \frac{\sum_{t=1}^{n}\left(D_t^{\,2}\right)}{n} = \frac{\sum_{t=1}^{n}\left(\left(R_t - R_{average}\right)^2\right)}{n} \quad (5)$$

The volatility for period *t* is calculated as below:

$$Vol_t = \sqrt{\frac{\sum_{t=1}^{n}\left(D^2\right)}{n}} = \sqrt{\frac{\sum_{t=1}^{n}\left(\left(R_t - R_{average}\right)^2\right)}{n}} \quad (6)$$

Mathematical Derivative of Pearson Product Moment Correlation Coefficient

Consider the Pearson product-moment correlation coefficient of two *n*-dimensional vectors ***X*** = $\{X_1, X_2, ..., X_n\}$ and ***Y*** = $\{Y_1, Y_2, ..., Y_n\}$.Pearson correlation is states as the ratio between the covariance of *X* and *Y* and the product of their standard deviations. Pearson's correlation coefficient when applied to a population is commonly represented by below equation:

$$\rho_{X,Y} = \frac{\mathrm{cov}\left(X, Y\right)}{\sigma_X \sigma_Y} \quad (7)$$

Where, cov is the covariance, σ_X is the standard deviation of ***X***, and σ_Y is the standard deviation of ***Y***.

Then, covariance can be expressed as below:

$$\operatorname{cov}(X,Y)=E\left[\left(X-\mu_X\right)\left(Y-\mu_Y\right)\right] \quad (8)$$

Where, E is the expectation and μ_X is the mean of X.

Therefore, Equation (7) can be written as

$$\rho_{X,Y}=\frac{E\left[\left(X-\mu_X\right)\left(Y-\mu_Y\right)\right]}{\sigma_X\sigma_Y} \quad (9)$$

Then, mathematical equation for ρ can be expressed in terms of uncentered moments.

Mean of population is expressed as next equation,

$$\mu_X=\mathrm{E}\left[X\right],\ \mu_Y=\mathrm{E}\left[Y\right]$$

Variance of population is expressed as next equation,

$$\begin{aligned}\sigma_X^2&=\mathrm{E}\left[\left(X-\mathrm{E}\left[X\right]\right)^2\right]=\mathrm{E}\left[X^2-2X\,\mathrm{E}\left[X\right]+\left(E\left[X\right]\right)^2\right]\\&=\mathrm{E}\left[X^2\right]-2\mathrm{E}\left[X\right]\mathrm{E}\left[X\right]+\left(\mathrm{E}\left[X\right]\right)^2\\&=\mathrm{E}\left[X^2\right]-2\mathrm{E}\left[X\right]^2+\left(\mathrm{E}\left[X\right]\right)^2\\&=\mathrm{E}\left[X^2\right]-\mathrm{E}\left[X\right]^2\end{aligned}$$

$$\sigma_Y^2=\mathrm{E}\left[Y^2\right]-\mathrm{E}\left[Y\right]^2$$

Standard deviation of population is expressed as next equation,

$$\sigma_X=\sqrt{\mathrm{E}\left[X^2\right]-\mathrm{E}\left[X\right]^2},\ \sigma_Y=\sqrt{\mathrm{E}\left[Y^2\right]-\mathrm{E}\left[Y\right]^2}$$

Covarience of population is expressed as next equation,

$$\begin{aligned}\mathrm{E}\left[\left(X-\mu_X\right)\left(Y-\mu_Y\right)\right]&=\mathrm{E}\left[\left(X-\mathrm{E}\left[X\right]\right)\left(Y-\mathrm{E}\left[Y\right]\right)\right]\\&=\mathrm{E}\left[\left(XY-X\,\mathrm{E}\left[Y\right]-Y\,\mathrm{E}\left[X\right]+\mathrm{E}\left[X\right]\mathrm{E}\left[Y\right]\right)\right]\\&=\mathrm{E}\left[XY\right]-\mathrm{E}\left[X\right]\mathrm{E}\left[Y\right]-\mathrm{E}\left[X\right]\mathrm{E}\left[Y\right]+\mathrm{E}\left[X\right]\mathrm{E}\left[Y\right]\\&=\mathrm{E}\left[XY\right]-\mathrm{E}\left[X\right]\mathrm{E}\left[Y\right]\end{aligned}$$

Therefore, Equation (9) can be represented as:

$$\rho_{X,Y}=\frac{E\left[XY\right]-E\left[X\right]E\left[Y\right]}{\sqrt{E\left[X^2\right]-\left[E\left[X\right]\right]^2}\sqrt{E\left[Y^2\right]-\left[E\left[Y\right]\right]^2}} \quad (10)$$

Then, the equation for sample is derived. Sample Pearson's correlation coefficient is commonly represented by the letter r .Consider the sample of dataset $\boldsymbol{x} = \{x_1,...,x_n\}$ containing n values and another dataset $\boldsymbol{y} = \{y_1,...,y_n\}$ containing n values then that formula for r is:

$$r_{x,y} = \frac{\text{cov}(x,y)}{s_x s_y} \qquad (11)$$

Where, cov is the covariance, s_x is the standard deviation of ***x***, and s_y is the standard deviation of ***y***.

Then, sample covariance can be expressed as below:

$$\text{sample}\,\text{cov}(x,y) = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{n-1} \qquad (12)$$

Therefore, Equation (11) can be written as:

$$r_{x,y} = \frac{\left[\dfrac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{n-1}\right]}{s_x s_y} \qquad (13)$$

Then, mathematical equation for *r* can be expressed in terms of uncentered moments.

Mean of sample,

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}, \quad \bar{y} = \frac{\sum_{i=1}^{n} y_i}{n}$$

Variance of sample,

$$\begin{aligned}
s_x^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2 &= \frac{1}{n-1}\sum_{i=1}^{n}\left([x_i]^2 - 2x_i\bar{x} + \bar{x}^2\right) \\
&= \frac{1}{n-1}\left[\sum_{i=1}^{n}(x_i)^2 - 2\sum_{i=1}^{n}(x_i\bar{x}) + \sum_{i=1}^{n}(\bar{x}\,\bar{x})\right] \\
&= \frac{1}{n-1}\left[\sum_{i=1}^{n}(x_i)^2 - 2n\bar{x}\,\bar{x} + n\bar{x}\,\bar{x}\right] = \frac{1}{n-1}\left[\sum_{i=1}^{n}(x_i)^2 - n\bar{x}\,\bar{x}\right] \\
&= \frac{1}{n-1}\left[\sum_{i=1}^{n}(x_i)^2 - n\left(\frac{\sum_{i=1}^{n}x_i}{n}\right)^2\right] = \frac{1}{n-1}\left[\sum_{i=1}^{n}(x_i)^2 - \frac{\left(\sum_{i=1}^{n}x_i\right)^2}{n}\right] \\
&= \frac{1}{n(n-1)}\left[n\sum_{i=1}^{n}(x_i)^2 - \left(\sum_{i=1}^{n}x_i\right)^2\right]
\end{aligned}$$

$$s_y^2 = \frac{1}{n-1}\sum_{i=1}^{n}\left(y_i - \bar{y}\right)^2 == \frac{1}{n\left(n-1\right)}\left[n\sum_{i=1}^{n}\left(y_i\right)^2 - \left(\sum_{i=1}^{n} y_i\right)^2\right]$$

Standard deviation of sample,

$$s_x = \sqrt{\frac{1}{n\left(n-1\right)}\left[n\sum_{i=1}^{n}\left(x_i\right)^2 - \left(\sum_{i=1}^{n} x_i\right)^2\right]}$$

$$s_y = \sqrt{\frac{1}{n\left(n-1\right)}\left[n\sum_{i=1}^{n}\left(y_i\right)^2 - \left(\sum_{i=1}^{n} y_i\right)^2\right]}$$

Covarience of sample,

$$\begin{aligned}
\operatorname{cov}\left(x,y\right) = \frac{\sum_{i=1}^{n}\left(x_i - \bar{x}\right)\left(y_i - \bar{y}\right)}{n-1} &= \frac{1}{n-1}\sum_{i=1}^{n}\left(x_i y_i - x_i\bar{y} - \bar{x}y_i + \bar{x}\,\bar{y}\right) \\
&= \frac{1}{n-1}\left[\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i\bar{y} - \sum_{i=1}^{n} y_i\bar{x} + \sum_{i=1}^{n}\bar{x}\,\bar{y}\right] \\
&= \frac{1}{n-1}\left[\sum_{i=1}^{n} x_i y_i - n\bar{x}\,\bar{y} - n\bar{y}\,\bar{x} + n\bar{x}\,\bar{y}\right] \\
&= \frac{1}{n-1}\left[\sum_{i=1}^{n} x_i y_i - 2n\bar{x}\,\bar{y} + n\bar{x}\,\bar{y}\right] = \frac{1}{n-1}\left[\sum_{i=1}^{n} x_i y_i - n\bar{x}\,\bar{y}\right] \\
&= \frac{1}{n-1}\left[\sum_{i=1}^{n} x_i y_i - n\left(\frac{\sum_{i=1}^{n} x_i}{n}\right)\left(\frac{\sum_{i=1}^{n} y_i}{n}\right)\right] = \frac{1}{n-1}\left[\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i\left(\frac{\sum_{i=1}^{n} y_i}{n}\right)\right] \\
&= \frac{1}{n\left(n-1\right)}\left[n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i\sum_{i=1}^{n} y_i\right]
\end{aligned}$$

Therefore, Equation (13) can be represented as:

$$r_{x,y} = \frac{\frac{1}{n(n-1)}\left[n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i\right]}{\sqrt{\frac{1}{n(n-1)}\left[n\sum_{i=1}^{n}(x_i)^2 - \left(\sum_{i=1}^{n} x_i\right)^2\right]}\sqrt{\frac{1}{n(n-1)}\left[n\sum_{i=1}^{n}(y_i)^2 - \left(\sum_{i=1}^{n} y_i\right)^2\right]}}$$

$$= \frac{\frac{1}{n(n-1)}\left[n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i\right]}{\frac{1}{n(n-1)}\sqrt{\left[n\sum_{i=1}^{n}(x_i)^2 - \left(\sum_{i=1}^{n} x_i\right)^2\right]}\sqrt{\left[n\sum_{i=1}^{n}(y_i)^2 - \left(\sum_{i=1}^{n} y_i\right)^2\right]}}$$

$$= \frac{\left[n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i\right]}{\sqrt{\left[n\sum_{i=1}^{n}(x_i)^2 - \left(\sum_{i=1}^{n} x_i\right)^2\right]}\sqrt{\left[n\sum_{i=1}^{n}(y_i)^2 - \left(\sum_{i=1}^{n} y_i\right)^2\right]}} \quad (14)$$

RESULTS AND DISCUSSION

In determining the correlation analysis, the characteristics of data need to be performed. One of the important analyses is the normal distribution checking of data. This is very important step to determine the appropriate method for data analysis.

Share price analysis

Figure 1 show the dynamic behavior of share price for Bank Islam Malaysia Berhad (BIMB). The period for trading period is selected from 1st April 2016 until 31st May 2016.The trading days involved in this analysis is 43 days. The minimum value of share price is MYR 3.81 on first trading day. Then, the maximum value of share price is MYR 4.01on 43rd day trading.

` The normality test is performed to check the distribution of data. Table 1 shows the p-value of share price is 0.198 according to normality test (Shapiro-Wilk). Therefore, this value is over than 0.05, it is shows that the distribution of share price is follow normal distribution. This is validated by graphical distribution in histogram (Figure 2) and normal probability (Figure 3). Both of Figure 2 and Figure 3 show an agreement that data distribution is follow normal distribution.

Figure 1: The dynamic behavior of share price

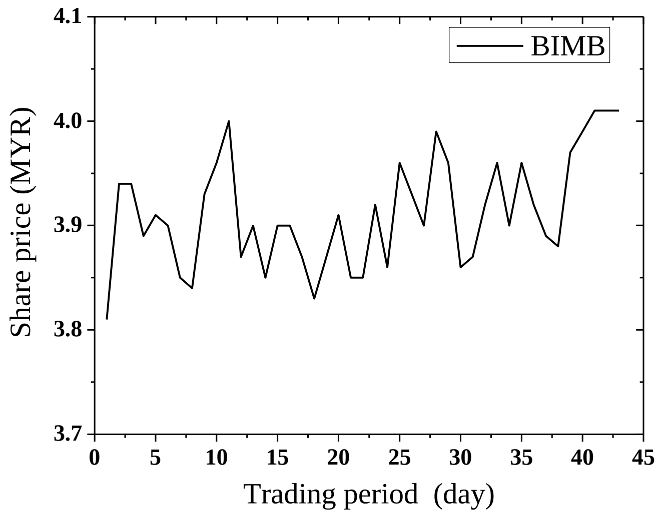

Figure 2: Histogram of share price

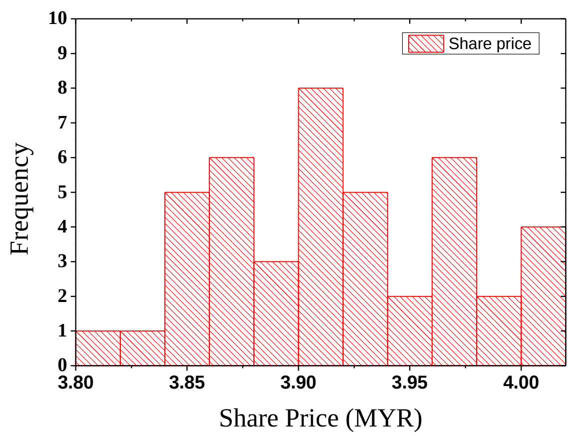

Figure 3: Normal probability plot of share price

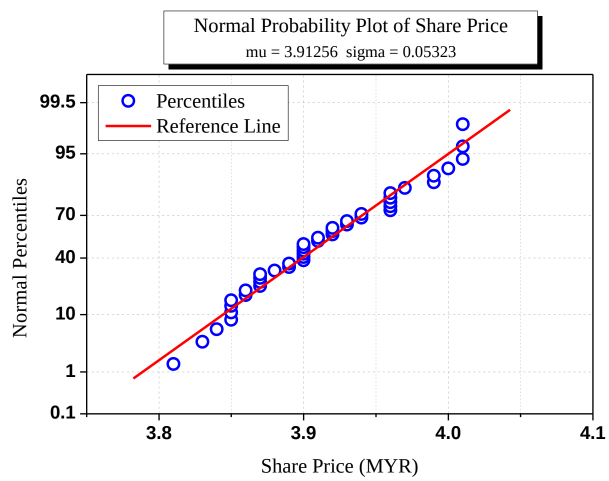

Table 1: Test of normality for share price

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Share price	.105	43	.200*	.964	43	.198

Return analysis

Figure 4 show the dynamic behavior of return for Bank Islam Malaysia Berhad (BIMB). The period for trading period is selected from 1st April 2016 until 31st May 2016. The trading days involved in this analysis is 43 days. The minimum value of return is -3.25 %on 12th trading day. Then, the maximum value of return is 3.41 % on 2nd day trading.

The normality test is performed to check the distribution of data. Table 2 shows the p-value of return is 0.841 according to normality test (Shapiro-Wilk). Therefore, this value is over than 0.05, it is shows that the distribution of return is follow normal distribution. This is validated by graphical distribution in histogram (Figure 5) and normal probability (Figure 6). Both of Figure 5 and Figure 6 show an agreement that data distribution is follow normal distribution.

Figure 4: The dynamic behavior of return

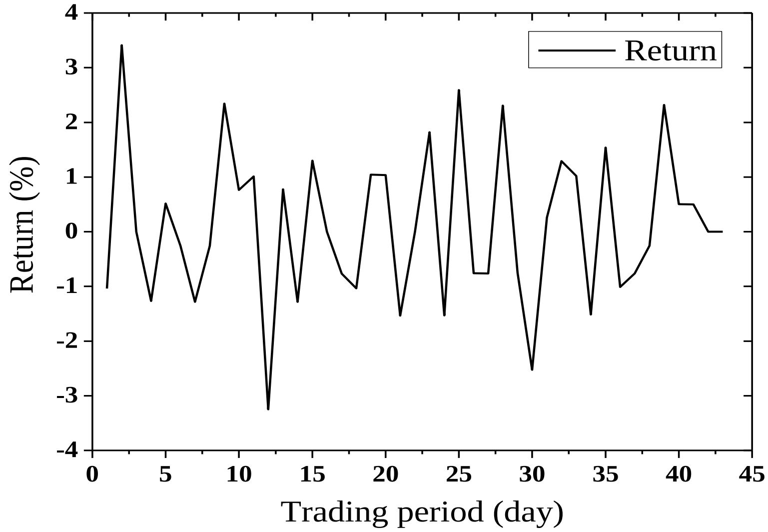

Figure 5: Histogram of return

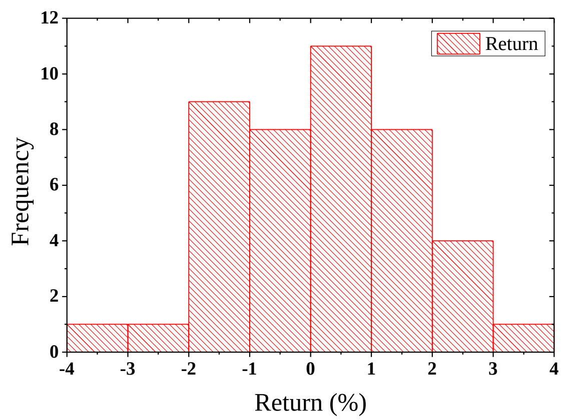

Figure 6: Normal probability plot of return

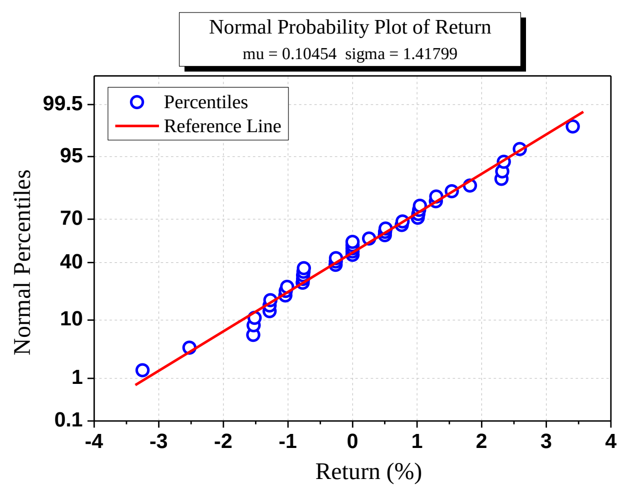

Table 2: Test of normality for return

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Return	.099	43	.200*	.985	43	.841

Deviation of Volatility analysis

Figure 7 show the dynamic behavior of deviation of volatility for Bank Islam Malaysia Berhad (BIMB). The period for trading period is selected from 1st April 2016 until 31st May 2016. The trading days involved in this analysis is 43 days. The minimum value of deviation is -3.35 on 12th trading day. Then, the maximum value of return is 3.30 on 2nd day trading.

The normality test is performed to check the distribution of data. Table 3 shows the p-value of deviation is 0.841 according to normality test (Shapiro-Wilk). Therefore, this value is over than 0.05, it is shows that the distribution of return is follow normal distribution. This is validated by graphical distribution in histogram (Figure 8) and normal probability (Figure 9). Both of Figure 8 and Figure 9 show an agreement that data distribution is follow normal distribution.

Figure 7: The dynamic behavior of deviation

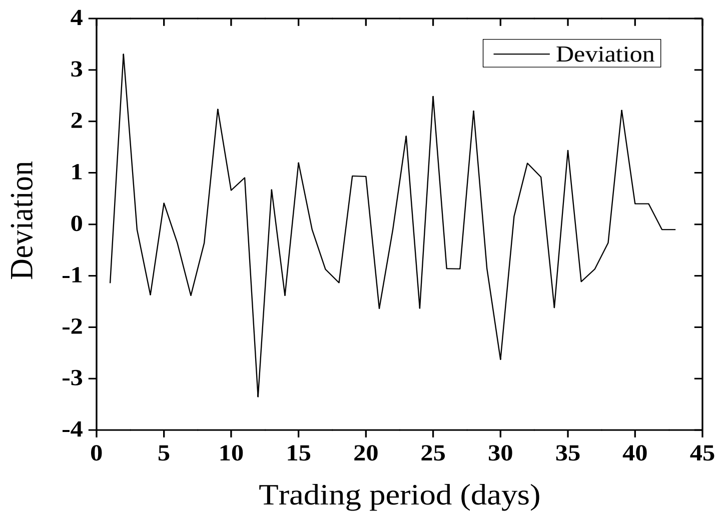

Figure 8: Histogram of return

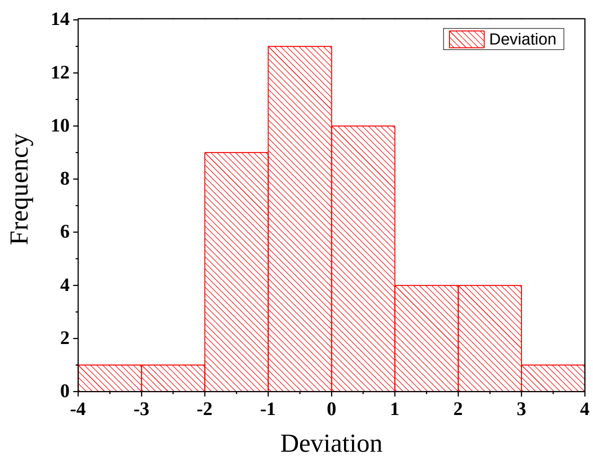

Figure 9: Normal probability plot of return

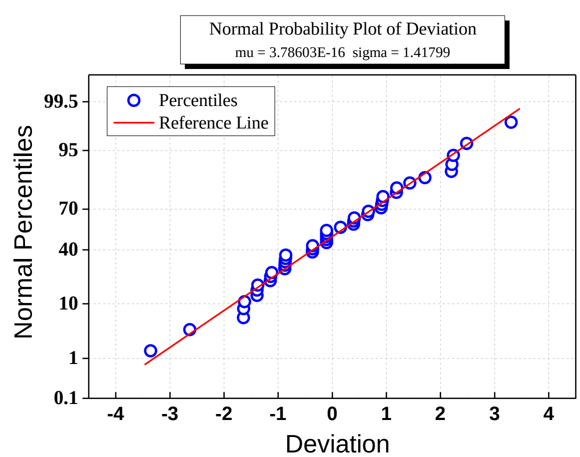

Table 3: Test of normality for return

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Deviation	.099	43	.200[*]	.985	43	.841

Correlation analysis for deviation and return

In this analysis, Pearson correlation is selected because the data for return and deviation of volatility are complying with below assumptions:

a. Both of data type is ratio type.
b. The relationship between return and deviation of volatility is linear.
c. No significant outlier in the data.
d. Variables are normally distributed.

Therefore, this research performs the Person correlation analysis to check the relationship between return and deviation of volatility. Figure 10 shows the data distribution between return and deviation of volatility. From the figure, it shows linear relationship between these two variables. The fitting equation for the two variables is represented by below equation:

Return =0.1 + (1) Deviation of Volatility *(15)*

To validate the correlation between these two variables, Pearson correlation analysis is performed. Table 4 shows the result for Pearson correlation analysis between return and deviation of volatility. There is a strong, positive correlation between return and volatility, which was statistically significant ($r = 1.000$, $n = 43$, $p = .000$).

Figure 10: Correlation between volatility and return

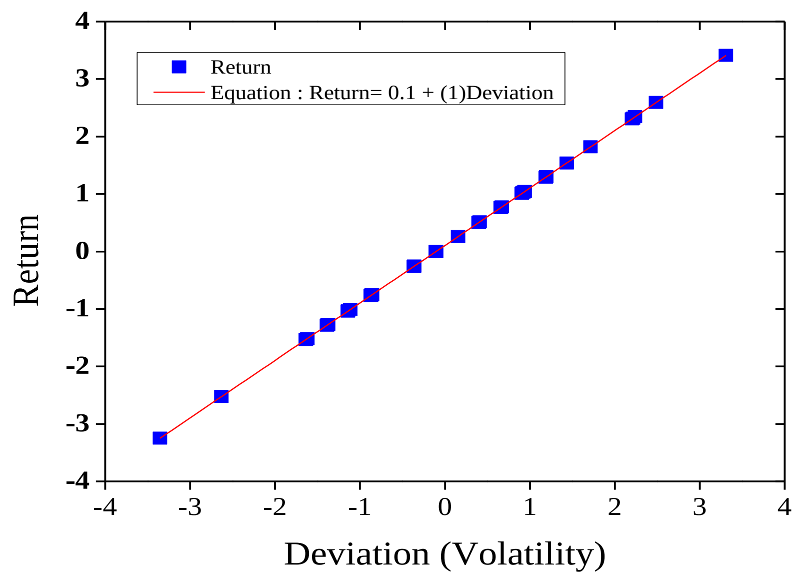

Table 4: Correlation Test of normality for return and deviation (volatility)

		Deviation(Volatility)
Return	Pearson Correlation	1.000**
	Sig. (2-tailed)	.000
	N	43

CONCLUSION

Volatility of stock markets has created much attention among investors because high volatility can bring high returns or losses to investors. This paper investigates the volatility of Islamic bank shares price in Malaysian market. Pearson correlation coefficient analysis is selected to calculate the correlation between volatility and return. This study found that following important results:

a. The distribution of share price for Bank Islam Malaysia Berhad (BIMB) is follow normal distribution according to Shapiro-Wilk normality test. The period for trading period is selected from 1st April 2016 until 31st May 2016.
b. The p-value for distribution data of return is 0.841 in Shapiro-Wilk normality test. Therefore, this value is over than 0.05, it is shows that the distribution of return is follow normal distribution.
c. The normality test is performed to check the distribution of data. Table 3 shows the p-value of deviation is 0.841 according to normality test (Shapiro-Wilk). Therefore, this value is over than 0.05, it is shows that the distribution of return is follow normal distribution.
d. Finally, this research performs the Person correlation analysis to check the relationship between return and deviation of volatility. To validate the correlation between these two variables, Pearson correlation analysis is performed. Pearson correlation analysis shows there is a strong, positive correlation between return and volatility, which was statistically significant ($r = 1.000$, $n = 43$, $p = .005$).

REFERENCES

Albaity, M.S. and Shanmugam, T. (2012). An Analysis of Volatility Co-Movement between Malaysia, US, UK and Japan Stock Market, Asian Journal of Finance and Accounting, Vol. 4, Iss.2 pp. 155-179

Al Nasser, S.A.S and Muhammed, J. (2013), Introduction to history of Islamic banking in Malaysia, Humanomics, Vol. 29 Iss. 2 pp. 80 – 87

Abraham, A., Roselina, S., Siti, M. &Siti, Z. (2007). Forecasting time series data using hybrid grey relational artificial neural network and auto regressive integrated moving average model.Neural Network World 6/07, 573-605.

Abd.Majid, M.S. and Kassim, S.H, (2015) Assessing the contribution of Islamic finance to economic growth Empirical evidence from Malaysia, Journal of Islamic Accounting and Business Research, Vol. 6 Iss. 2 pp. 292 – 310

Boonvorachote, T. and Lakmas, K. (2016) Price volatility, trading volume, and market depth in Asian commodity futures exchanges, Kasetsart Journal of Social Science, Vol. 37, Iss. 1, pp. 53-58

Byun, S.J., Rhee, D.W. and Kim, S. (2011), Intraday volatility forecasting from implied volatility, International Journal of Managerial Finance, Vol. 7, Iss. 1, pp. 83 – 100

Brailsford, T. J. & Faff, R.W. (1996). An Evaluation of Volatility Forecasting Techniques, Journal of Banking and Finance, 20, 419-438

Faff, R.W. and McKenzie, M.D., (2007), The relationship between implied volatility and autocorrelation, International Journal of Managerial Finance, Vol. 3 Iss. 2 pp. 191 – 196

Kuo, W.H., Hsu, H. and Chiang, C Y., (2005) Price Volatility, Trading Activity and Market Depth: Evidence from Taiwan and Singapore Taiwan Stock Index Futures Markets, Asia Pacific Management Review, Vol. 10, No. 1, pp. 131-143

Lee, H.S., Ng, D.C.Y., Lau, T.C. and Ng, C.H. (2016)Forecasting Stock Market Volatility on Bursa Malaysia Plantation Index, International Journal of Finance and Accounting, Vol. 5 Iss. 1, pp. 54-61

Moreno, A. M., Zarrias, J.A. and Barbero, J.L. (2014), The relationship between growth and volatility in small firms, Management Decision, Vol. 52 Iss. 8 pp. 1516 – 1532

Singhania, M. and Anchalia, J. (2013), Volatility in Asian stock markets and global financial crisis, Journal of Advances in Management Research, Vol. 10 Iss. 3 pp. 333 – 351

Siddikee, M.N. and Begum, N.N (2016) Volatility of Dhaka Stock Exchange, International Journal of Economics and Finance Vol. 8, No. 5, pp.220-229

Tan, Y. and Floros, C. (2012), Stock market volatility and bank performance in China, Studies in Economics and Finance, Vol. 29 ,Iss. 3, pp. 211 – 228

Watanabe, T. (2001), Price volatility, trading volume, and market depth: evidence from the Japanese stock index futures market, Applied Financial Economics, Vol. 11 No. 6, pp. 651-658.

